Amendments to the Drawings:

Enclosed is one sheet of drawing. Please add this drawing to this application. This sheet of drawing adds the figure referred to in the International PCT Application serial no. PCT/AU2004/001661 at page 4, lines 26-31 that had been inadvertently omitted from the International application.. This drawing is the same as the drawing included in priority application AU 2003906534. In accordance with 37 C.F.R. § 1.57(a), Applicant is permitted to amend this application to included the inadvertently omitted drawing. As required by 36 C.F.R. § 1.57(a)(1)(i), enclosed is a copy of the prior-filed application, AU 2003906534.

Attachments: Replacement Sheet

REMARKS

Enclosed is a substitute specification. The substitute specification includes no new matter. Applicant has added paragraph numbering to this substitute and has added appropriate headings, such as Summary of the Invention, etc.

The claims have been amended to more clearly point out that which Applicant is claiming as Applicant's invention.

Date May 26, 2006

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PCT/AU2004/001661

Australian Government

Patent Office
Canberra

I, LEANNE MYNOTT, MANAGER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2003906534 for a patent by BLUESCOPE STEEL LIMITED as filed on 26 November 2003.

COMMONWEALTH OF AUSTRALIA
AUSTRALIA
PATENT OFFICE

WITNESS my hand this
Fourteenth day of December 2004

LEANNE MYNOTT
MANAGER EXAMINATION SUPPORT
AND SALES

AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION

Applicant(s):

BLUESCOPE STEEL LIMITED

Invention Title:

COATED STEEL STRIP

The invention is described in the following statement:

COATED STEEL STRIP

The present invention relates to a method of forming a zinc/aluminum alloy coated steel strip with a brushed finish.

US patent 6,440,582 in the name of Bethlehem Steel Corporation ("BSC") discloses a method of forming a zinc/aluminium alloy coated steel strip that has an advantageous appearance of brushed stainless steel.

The BSC method requires that the zinc/aluminium alloy coated steel strip have a minimum spangle size. Specifically, the BSC method includes coating steel strip in a molten bath of zinc/aluminium alloy that is modified with grain refiner compounds, such as selected borides, carbides and aluminides, which minimize the spangle size of the resultant zinc/aluminium alloy coating of the coated steel strip that emerges from the coating bath.

The use of the above grain refiner compounds in a hot dipped coating bath can be inconvenient because of the consequential delays and costs in production change-over.

The applicant has developed an alternative method of forming a zinc/aluminium alloy coated steel strip that has a brushed finish.

The method of the present invention does not require that the zinc/aluminium coated steel strip have a minimum spangle size and, specifically, does not require the addition of grain refiner compounds to a hot dip molten bath of zinc/aluminium alloy.

According to the present invention there is provided a method of forming a zinc/aluminium alloy coated

steel strip that has a brushed finish which comprises the steps of:

(a) passing steel strip through a molten bath of zinc/aluminium alloy and forming a coating of zinc/aluminium alloy having spangles on at least one surface of the strip;

(b) skin pass rolling the zinc/aluminium alloy coated steep strip to suppress and/or obscure the spangles on the surface; and

(c) brushing the skin passed rolled zinc/aluminium alloy coated steel strip.

The brushed finish of the zinc/aluminium alloy coated steel strip makes it suitable for a wide range of end-use applications in an unpainted form.

Whilst it is known to skin pass roll zinc/aluminium coated steel strip, the conventional purpose of skin pass rolling is to condition the coated strip surface (with minimal thickness reduction) to smooth the surface and to flatten surface defects, such as pin-holes and surface dross, when such surface defects are present.

Skin pass rolling is necessary for and usually confined to situations in which the zinc/aluminium alloy coated steel strip is to be used for subsequent processing in a paint coating line.

The applicant is not aware of the use of skin pass rolling zinc/aluminium alloy coated steel strip for the purpose of suppressing and/or at least partially obscuring the spangled surface of the coated strip.

Preferably the step of skin pass rolling the zinc/aluminium alloy coated steel strip includes using rolls having a surface roughness of Ra of 0.4 to 4.5 microns.

The step of brushing the skin pass rolled zinc/aluminium alloy coated steel strip may be carried out by any suitable means, such as a rotary brushing roll. Well known methods of brushing metals on an industrial scale may, in some embodiments, be used.

Preferably the method further includes a step of forming a transparent or translucent coating of a clear paint or lacquer on the skin pass rolled zinc/aluminium alloy coated steel strip. The clear paint coat may, for example, be selected from finishes, such as, gloss, semi-gloss, low sheen or micro-wrinkle clear paint in order to further control additional suppression and/or obscuring of spangle appearance. The coating may optionally be slightly pigmented, yet still transparent or translucent, to provide an appearance having a particular weak colour or hue. Specifically pigments in the substantially clear paint, such as, for example, pearlescent, metallic pigment, metallic flake or other specialty effect pigment may be used in low quantities to enhance the visual appearance of the product.

The present invention is described further by way of example with reference to the accompanying schematic drawing of one embodiment of a continuous production line for producing brushed zinc/aluminium alloy coated steel strip in accordance with the method of the present invention.

With reference to the drawing, in use, coils of cold rolled steel strip are uncoiled at an uncoiling station 1 and successive uncoiled lengths of strip are

welded end to end by a welder 2 and form a continuous length of strip.

The strip is then passed successively through an accumulator 3, a strip cleaning section 4 and a furnace assembly 5. The furnace assembly 5 includes a preheater, a strip preheating reducing furnace, and a strip reducing furnace.

The strip is heat treated in the furnace assembly 5 by careful control of process variables including: (i) the temperature profile in the furnaces, (ii) the reducing gas concentration in the furnaces, (iii) the gas flow rate through the furnaces, and (iv) strip residence time in the furnaces (i.e. line speed).

The process variables in the furnace assembly 5 are controlled so that the strip has required mechanical properties, oxide coatings are removed from the surface of the strip, and residual oils and iron fines are removed from the surface of the strip.

The heat treated strip is then passed via an outlet snout downwardly into and through a bath of molten coating metal, namely zinc/aluminium alloy, held in a coating pot 6 and is coated with zinc/aluminium alloy.

The molten bath does not contain grain refiner compounds such as, by way of example, the compounds disclosed in the above-mentioned BSC US patent.

The zinc/aluminium alloy is maintained molten in the coating pot by the use of heating inductors (not shown).

Within the bath the strip passes around a sink roll and is taken upwardly out of the bath.

After leaving the coating bath 6 the zinc/aluminium alloy coated strip passes vertically through a gas wiping station (not shown) at which its coated surfaces are subjected to jets of wiping gas to control the thickness of the coating.

The zinc/aluminium alloy coated strip is then passed through a cooling section 7 and is subjected to forced air-cooling. The surfaces of the zinc/aluminium alloy coatings on the strip comprise spangles of standard size.

The cooled, zinc/aluminium alloy coated strip is then passed through a rolling section 8 that skin pass rolls the surface of the strip. The rolling conditions, particularly the surface roughness of the rolls, are selected so that the skin pass rolling alters the spangled surfaces to the extent that the spangles are obscured and/or at least partially suppressed.

The skin pass rolled zinc/aluminium alloy coated strip is thereafter coiled at a coiling station 10.

The skin pass rolled zinc/aluminium alloy coated strip is then uncoiled and passed through a brushing station at which rotary brushes brush the surfaces of the strip, with the result that the surfaces have an appearance that is similar to brushed stainless steel or brushed aluminium.

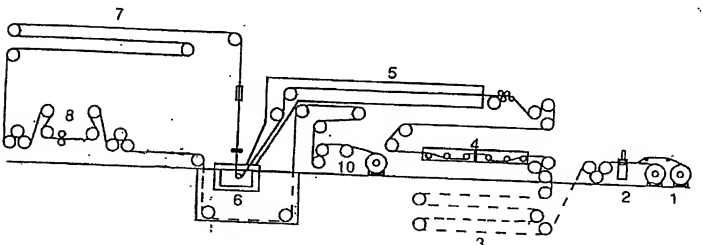
The brushed skin pass rolled zinc/aluminium alloy coated strip is thereafter optionally passed to a cleaning and drying station. The strip is then passed to a coating station at which a clear paint coating is applied to the strip. The clear paint coat is substantially transparent or translucent and may contain decorative or functional

pigments or fillers. An example of a functional filler is silica, which among many other materials or methods, may be used to control gloss, or light scattering through the coating. An example of a decorative pigment is finely dispersed metallic flake. Another example is a light dye. Either of which may provide a specific visual effect or a specific small colour shift or impart a specific finished product hue.

The painted coated strip is then passed to a paint curing station. The strip is then passed to a cooling station at which the strip is water quenched. The strip is then passed to a drying station and coiled at a coiling station.

Many modifications may be made to the preferred embodiment described above without departing from the spirit and scope of the present invention.

The reference to any prior art in this specification is not, and should not be taken as, an acknowledgement or any form of suggestion that the prior art forms part of the common general knowledge in Australia.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